

What Is Claimed Is:

1. A method of paging UEs to provide MBMS service in mobile communication system, the method comprises steps of:

5 (a) Broadcast and multicast service center (BM-SC) sending data to Service GPRS Supporting Node (SGSN) via Gateway GPRS Supporting Node (GGSN);

(b) After Service GPRS Supporting Node (SGSN) receives data from Gateway GPRS Supporting Node (GGSN), it sending MBMS notification to Radio network controller (RNC);

10 (c) After RNC receives the notification from SGSN, it organizing the frame according to a paging channel (PCH) Iub frame protocol (FP) according to the notification, wherein the frame includes a MBMS Indicator bit (MI) to the frame of the frame protocol (PCH IubFP), which includes MBMS PI and paging message;

15 (d) Radio Network Controller (RNC) sending the frame of frame protocol (PCH IubFP) to Base Station (Node B); and

20 (f) Base Station (Node B) transmitting a Temporary MBMS Group Identity (MBMS TMGI) or MBMS Paging Indicator (PI) to by using the last 12 bits of a paging indicator channel (PICH) and Secondary Common Control Physical Channel (SCCPCH) frame that carries paging message for User Equipment (UE).

25 2. The method as claimed in claim1, wherein after the step (j), User Equipment (UE) determines whether to send paging response message to the network according to the requirements of the system.

30 3. The method as claimed in claim1, wherein in the step (c), the Paging Indicator includes MBMS PI-bitmap, and MBMS Indicator (MI) and the MBMS PI-bitmap are placed in the reserved part and the extensible part of the frame structure of the frame protocol (PCH IubFP) respectively.

35 4. The method as claimed in claim1, wherein in the step (c), the Paging Indicator includes MBMS Group Identity mask (TMGI mask) and MBMS Indicator (MI) and the TMGI mask are placed in the reserved part and the extensible part of the frame structure of the frame protocol (PCH IubFP) respectively.

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5. The method as claimed in claim 1, wherein in the step (c), the MBMS Indicator (MI) is placed in the reserved part of the frame structure of the frame protocol (PCHubFP).

5 6. The method as claimed in claim 3, wherein the reserved 12 bits of the Paging Indicator Channel (PICH) are divided into N_m groups and the number of groups N_m can be either fixed or variable, the value of N_m can be 1, 2, 3, 4, 6, or 12, each group stores a MBMS Paging Indicator (MPI), each Temporary MBMS Group Identity (TMGI) will obtain a MBMS Paging Indicator (MPI), whose
10 calculation method is: $MPI = (TMGI \div 8192) \bmod N_m$, wherein MPI is the MBMS Paging Indicator represented by each group described, and TMGI indicates Temporary MBMS Group Identity (TMGI), "Div" indicates round-off operation for division and "mod" indicates modulus operation.

15 7. The method as claimed in claim 4, wherein the reserved 12 bits of Paging Indicator Channel (PICH) are divided into m MBMS Paging Groups (MPG) and the number of groups m can be either fixed or variable, the value of m can be 1, 2, 3, 4, 6, or 12; each group stores a MBMS Group Identity mask (TMGI mask),
20 whose calculation method is: $TMGI \text{ mask} = TMGI \bmod (2^{12/m})$, the calculation method for the group position of TMGI mask (MPG _{i}) in 12 bits is: $i = TMGI \bmod m$, wherein TMGI indicates Temporary MBMS Group Indicator, and TMGI mask indicates Group Identity mask, "mod" indicates modulus operation and "i" indicates group position.

25 8. The method as claimed in claim 5, wherein several bits are selected from the reserved 12 bits of Paging Indicator Channel (PICH) to be used as MBMS Paging Indicator.

30 9. The method as claimed in claim 1, wherein a new element of "Terminating MBMS Call" is added to the definition of "Paging Cause" of existing paging message "Paging Type 1" and a new element "Temporary MBMS Group Identity (MBMS TMGI)" is added to the definition of "UE Identity" of existing paging message "Paging Type 1".
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10. The method as claimed in claim 9, wherein the paging message of "Paging Type 1" includes MBMS Service ID.

11. The method as claimed in claim 9, wherein the paging message of "Paging Type 1" includes Response Indicator.

12. The method as claimed in claim 9, wherein the paging message of "Paging Type 1" includes Activation time.

13. The method as claimed in claim 1, wherein the paging message adopts "MBMS Paging".

14. The method as claimed in claim 13, wherein the "MBMS Paging" message includes MBMS Group Indicator (TMGI) and MBMS Service ID.

15. The method as claimed in claim 13, wherein the "MBMS Paging" message includes Response Indicator.

16. The method as claimed in claim 13, wherein the "MBMS Paging" message includes Activation time.

17. The method as claimed in claim 1, wherein that the radio bearer parameters includes: Radio Bearer information (RB info), Transfer Channel information (TrCH info), Physical Channel information (PhyCH info), Code information (Code info), Transfer Format Set (TFS), Transfer Format Combination Set (TFCS) and Activation time.

18. The method as claimed in claim 1, wherein the Base Station (Node B) determines the frame of the frame protocol (PCH IubFP) as if MI equals to 0, it indicates that the frame of the frame protocol (PCH IubFP) belongs to conventional paging; if MI equals 1, it indicates that the frame of the frame protocol (PCH IubFP) includes MBMS service information.

19. The method as claimed in claim 1, wherein a User Equipment (UE) examines the last 12 bits of PICH and reads the SCCPCH frame to acquire MBMS

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· paging message if the PICH indicate to read the SCCPCH;

20. The method as claimed in claim 1, wherein the paging message received by UE including radio bearer parameters, UE sets up radio bearer.